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OVERSITE REVIEW/GENERAL ASSESSMENT
OF SITE INVESTIGATION
VAN TRAN ELECTRIC COMPANY
VANDALIA, ILLINOIS

Illinois Environmental Protection Agency
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1.0 INTRODUCTION

On Monday, April 20, 1987, site activity commenced at the Van Tran Electric Company facility in Vandalia, Illinois as per the consent plan between the Illinois Environmental Protection Agency (IEPA) and Van Tran Electric Company (Van Tran), dated March 1, 1987. Under this plan Van Tran agreed to conduct the site investigation as outlined by Envirodyne Engineers, Inc.'s (EEI) "Recommendations", dated January, 1987. Included in this agreement is a provision for activity oversight by IEPA or its designee. In this case, oversight was conducted by EEI as IEPA's designee.

Personnel involved in the initial site activity included EEI for oversight; Baker/TSA to coordinate and execute site activity for Van Tran, and Professional Service Industries (PSI) to conduct drilling and monitor well installation under Baker/TSA direction. Individuals on site included:

- EEI - Dale T. Cira
Geoffrey M. Burke - (1 day substitute) - "IEPA oversight"
- Baker/TSA - Dan G. Bradfield - Site Coordinator
Sandra Derby - Site Health & Safety Officer
- PSI - Ralph Fernandez - Driller
Mark Migliazza - Driller's helper
Steve Heuer - Decontamination helper

Soil sampling, wipe samples and monitor well installation activities were conducted from April 20, to April 28, 1987 and were continuous with the exception of Sunday, April 26. Complete daily logs provided in Appendix A, were copied from the field book.

Activities carried out during this period include PCB wipe sample collection, surficial soil sample collection, deep soil boring sample collection, monitor well installation, associated sample collection, and a deep boring to bedrock.

Off-site PCB sample collection and groundwater sample collection activities were carried out on May 13, 1987. Dale Cira of EEI observed the groundwater sample collection procedures of Baker/TSA (Dan Bradfield). Max Gricevich, assisted by Greg Dunn of IEPA, collected the off-site sediment samples for PCB analysis.

Samples collected by Baker/TSA were sent to Gulf Coast Labs for analysis. Sample splits and additional samples required by IEPA were sent to ARDL, Inc. for analysis. PCB analyses for off-site samples were also analyzed by ARDL, Inc.

2.0 EVALUATION OF FIELD ACTIVITIES

Following is a narrative of each particular aspect of the Van Tran site activities conducted during the period of April 20 to April 28, 1987, and additional activities on May 13, 1987.

2.1 Site Safety

Sandra Derby of Baker/TSA's office in Pittsburgh, Pennsylvania acted as Site Health and Safety Officer (H&SO). She conducted an extensive safety briefing on the first morning of site activity. Topics included expected and potential chemical hazards, physical hazards, heat stress, contingency planning, and safe operating procedures. Each person was then test-fitted for respirator use - both half mask and full face. Every morning a brief safety meeting was held before beginning the day's activity.

The final, IEPA approved Site Safety Plan did not arrive on site until Tuesday, April 21. All drilling activity was put on hold pending receipt of the approved plan. Activities such as initial cleaning of equipment and PCB-wipe samples were conducted initially.

During all site activity, Ms. Derby set up the work zones at each site, monitored borings and samples and breathing zone with a HNU photoionization detector and made recommendations for safer site practices.

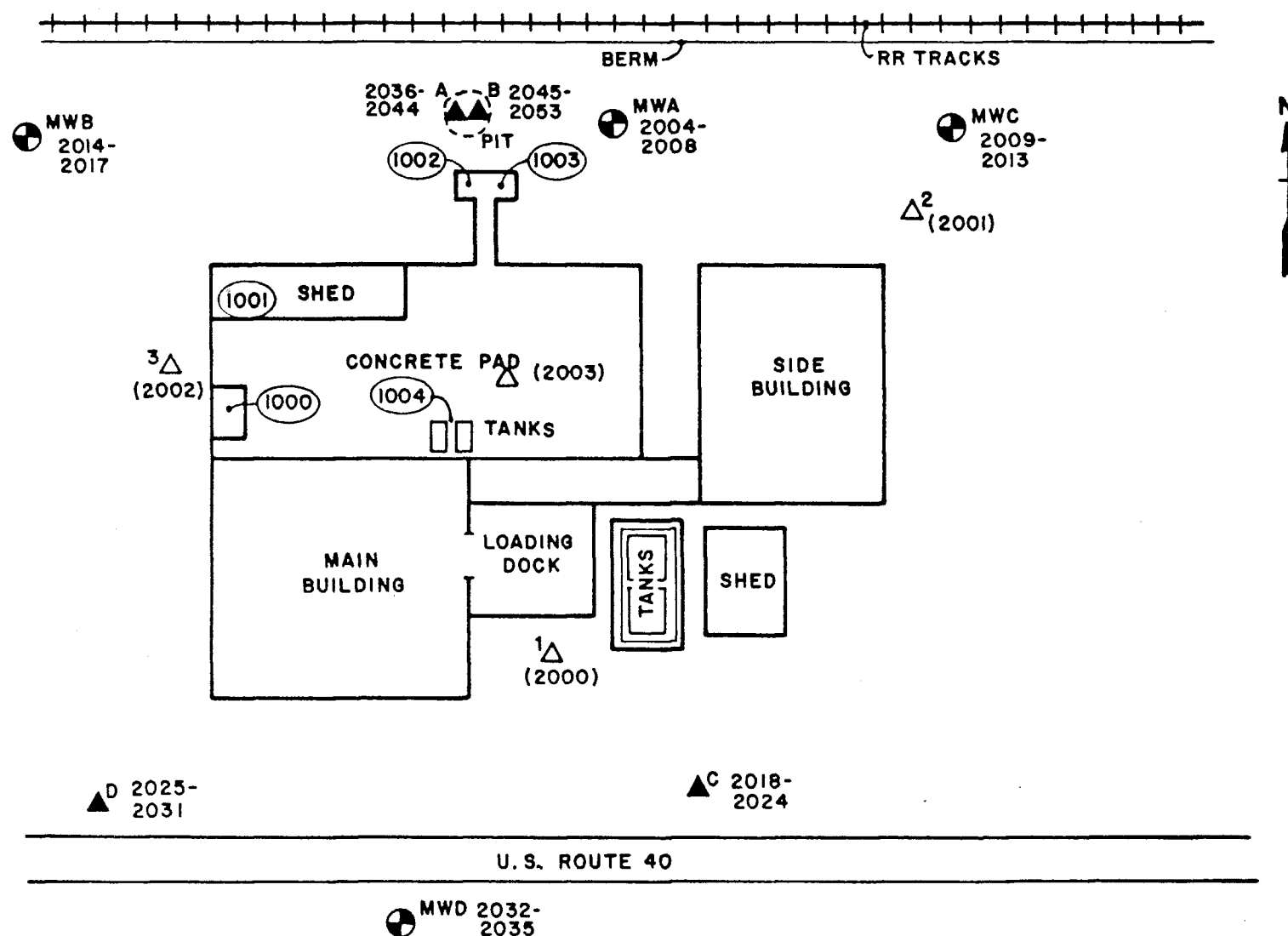
2.2 Wipe Sample Collection

A series of five wipe samples were collected in the pad area at the northwest corner of the processing building area. The sites sampled are depicted in Figure 1. The locations are the same as those described in the consent plan, with two exceptions, agreed upon among IEPA, EEI and Baker personnel during field reconnaissance: the burning pad (described as Site 1 in the Consent Plan) was split into west 1/2 and east 1/2 and analyzed as two samples (sample Nos. 1002 and 1003, respectively); the low lying area in the central portion of the pad showed heavy accumulation of sediments and was changed from a wipe sample to a soil sample. This sample designation is No. 2003.

Wipes were collected by compositing cotton ball wipe samples of three 100 cm² areas for each site. Hexanes were used as the wiping solvent. Precautions were taken to prevent cross contamination between sites. A single set of tongs was used to handle clean solvent-soaked cotton balls and place them on their respective squares. Another set was used to spread the cotton balls over the 100 cm² pattern. This set was rinsed with hexanes between sites. Wipe samples were collected by Dan Bradfield of Baker/TSA under Level C protection.

2.3 Soil Boring Sample Collection

Surficial and sub-surface soil samples were collected to evaluate the distribution of on-site contamination. Surficial samples included four locations, labelled 2000, 2001, 2002 and 2003 and are depicted in Figure 1. The bulk of the soil samples were collected from eight soil borings, including four borings for monitor well installation. A total of 50 samples were collected from these borings with three as duplicates for analysis. Those locations are also depicted in Figure 1 labelled as 2004-2053.



LEGEND

- WIPE SAMPLE
- WELL
- ▲ BORING
- △ SURFACE DRAINAGE
- () CORRESPONDING SAMPLE NUMBERS

ENVIRODYNE



ENGINEERS

NOT TO SCALE

FIGURE 1

Approximate Sample Collection Locations
VAN TRAN ELECTRIC

2.3.1 Surficial Soil Samples

The surficial soil samples were collected on April 21, 1987. Samples 2000, 2001 and 2002 correspond to sample numbers 1, 2, and 3, respectively, in the original EEI sampling plan. Sample 2003 corresponds to what was originally designated as a wipe sample (No. 4 in original plan).

Sample 2000 was collected with the drill rig by driving a steel 1-1/4 inch split spoon sampler into the compacted gravelled driveway to approximately 12 inches. Three locations were composited. A split sample (2000A) was collected for duplicate analysis by IEPA's designated laboratory.

Sample 2001 was collected from the area west of the concrete pad near the cooling racks. It was collected from four composites to four inches each, using a steel soil auger. Sample 2002 represents the area northeast of the main processing building. This sample was collected with a soil auger with three composites to a depth of six inches each.

Sample 2003 consisted of fine grained sediments, dust, and debris which settled onto the concrete pad in the center of the storage area. A stainless steel spoon was used to scrape these fines into a stainless steel bowl for mixing. Six areas were composited from an average depth of one inch. This sample was designated for PCB analysis only.

2.3.2 Soil Borings

Soil borings for analytical samples only were drilled at four locations at the Van Tran facility. These include borings labelled B-1, B-2, B-3 and B-4 in Figure 1. Specific sample numbers associated with these borings are described in Section 2.7. They included numbers 2018 thru 2031 and 2036 thru 2053.

Samples were collected using a CME-75, rotary drill rig with 3-3/4 inch hollow stem augers and 1-1/4 inch split spoon samplers. Samples were collected to a depth pre-determined as one foot above the estimated water table. This depth was determined by measuring the depth to water in the four existing wells the morning of drilling. Samples and the boring were continuously monitored by the site H&SO for volatile organic vapors with a HNU monitor.

Boring A was drilled in the western portion of the waste disposal pit north of the buildings at Van Tran. It was extended to a depth of 12 feet below ground level. Boring A was drilled on April 27 and included samples 2036 thru 2044. Samples from 0-1 foot (2036) and 2-5 feet (2038) were split with IEPA and labelled additionally as 2036A and 2038A. Samples were collected in 3-foot intervals from 2-5 feet and 5-8 feet. These include samples 2038 and 2039. Beyond the eight foot depth sample collection was resumed at one foot intervals.

HNU readings were very high during the drilling of boring A. Sample values ranged from 250 to 2000 ppm. The values peaked between four and six feet and decreased to near background levels near the end of the boring depth at 12 feet. HNU readings in the work zone measured between three and four ppm while drilling. Eight samples were collected at separate intervals distinct from this boring.

Boring B was drilled and sampled on April 27 and was located in the eastern half of the same waste disposal pit as boring A. This boring was advanced using the same HSA and split spoon technique. It was extended to a depth of 12 feet and included samples 2045-2053. Samples were taken from three-foot sample intervals at two to five feet (2047 and 2048 duplicate) and five to eight feet (2049). The remainder of the boring was sampled at one foot intervals. A total of eight intervals were sampled from boring B, with the additional samples of a field duplicate from two to five feet (2048) and an IEPA split sample from five to eight feet (2049A). HNU values were fairly high on some samples. Readings peaked at about 200 ppm in the five feet below ground level and dropped off sharply after seven feet. These intervals are noted in the boring logs. Work zone HNU values were less than four ppm during drilling.

Boring C was made on April 23 and located in the drainage area in the southeast corner of the Van Tran property. This boring was extended to a depth of seven feet below ground level and sampled at one foot intervals. Sampling technique was the same as described for borings A and B. These seven samples were numbered 2018 thru 2024 and were analyzed by ARDL, Inc. under IEPA's program. HNU readings of samples from this boring peaked at about 200 ppm about three feet below ground level. Values continued to read from 38 to 65 ppm thru the total 7.0 foot boring depth. Work zone readings were nearly background during drilling.

Boring D was drilled on 4/23 in the drainage area at the southwest corner of the Van Tran property. It was extended to 7.0 feet below ground level and was sampled at one-foot intervals. Sample numbers included 2025 thru 2031 and were all analyzed by ARDL, Inc. under the IEPA CLP program. Recovery problems were encountered during the first three feet of drilling, so the boring was moved 15 feet east in the drainage ditch. Recovery improved and sample collection resumed. HNU readings above background were not encountered during the drilling of this boring.

Samples collected from these borings were analyzed for the full priority pollutant listing of parameters. These include volatile organic target compounds, base-neutral-acid fractions, CLP-metals list and PCBs. Samples collected by Baker were analyzed by Gulf Coast Labs but not under the same procedure as the IEPA contract lab program. The chain-of-custody followed by Baker for sample integrity was an in-house procedure. Custody seals were placed on each bottle and on the cooler when sealed. A combination of chain-of-custody and analysis request form was filled out for each cooler. The EEI/IEPA representative witnessed each of these forms by signature.

Samples were collected from the split spoon and placed directly into the sample containers. Disposable wooden tongue depressors were used in handling sample material where necessary. The volatile organic fraction was collected initially and as quickly as possible into a 2 ounce, wide mouth jar. This was packed as tightly as possible to reduce head space. Samples which were split for IEPA were first split lengthwise in the split spoon, then divided. Samples analyzed by IEPA/ARDL either as split or as excess sample were physically collected by the EEI/IEPA representative in the same manner as described for the Baker samples. The IEPA samples were collected according to the IEPA CLP custody procedures and sent to ARDL, Inc. for analysis. Samples collected by Baker were iced down for shipment and samples collected by EEI/IEPA were kept cold with frozen blue-ice packs. All shipments were picked up daily on site by Federal Express Co. for next-day delivery to the appropriate laboratory.

Each boring not converted into a monitor well was sealed immediately upon sampling completion by grouting to the surface. A mixture of Portland Cement and bentonite powder, approximately 3:1, was pumped through the augers. Augers were retrieved one at a time and grouting continued in this manner until the boring was sealed.

2.3.3 Soil Samples - Monitor Well Borings

Samples were also collected from the borings drilled for well installation. These included borings labelled as MW-A, MW-B, MW-C and MW-D. These borings were drilled using hollow stem auger and split spoons continuously to the bottom of the determined screen depth. Samples for analysis were collected every five feet, covering an 18 inch interval per sample. Sample collection procedures were the same as described for the previous four soil borings which were taken for sample analysis only.

Boring MW-A was drilled on April 21, 1987 at the north central boundary of the Van Tran property. This boring was completed to a depth of 19.5 feet. Five samples were collected from this boring, labelled 2004 thru 2008. Of these five samples, two were split with IEPA, including 2004A and 2008A. The HNU recorded values of 3-4 ppm in the borehole and "0" in the work zone.

During the drilling of this boring, the driller used a solvent-lubricant (WD-40) on the threads of the auger pin, connecting the second and third auger flights. The driller was aware of procedures involving the use of lubricants. The IEPA/EEI representative noticed this use quickly, before excessive amounts were used. The pin was replaced and auger threads were quickly wiped down with clean rags. It was decided between Baker and the EEI representatives to continue with the same augers since only a very small quantity was used and because of the location on the drill stem. The position of the pin by the end of the boring was five feet above the top of the final screen placement, and should not have impacted soil or well sample integrity.

Boring MW-B was located at the northwest corner of the Van Tran property and drilled on April 23, 1987. This boring was extended to a depth of 20.5 feet. Four samples were collected for analysis from this well, including 2014 thru 2017. The contents of one Shelly tube was collected for physical analysis of the screened interval. No samples were selected for split with IEPA for analysis.

Boring MW-C was located at the northeast corner of the Van Tran property and drilled on April 22. This boring was drilled to 15-1/2 feet below ground level. Samples were collected at four intervals with one field duplicate collected at 12.0-13.5 foot interval. One sample was collected from the screened interval using a Shelby tube. These were labelled 2009 thru 2013. The screened interval (12 - 13.5 feet) was selected for the duplicate samples and labelled 2012 and 2013. No IEPA split samples were collected.

Boring MW-D was drilled as the background well and boring south of the highway across from the Van Tran property. This was drilled from April 24 to April 27, 1987. Total depth of this boring was 95.25 feet below ground level and extended to limestone bedrock. Samples for chemical analysis were collected from the portion of the boring being utilized for well construction. This included four samples 2032 to 2035. These were collected every five feet, with the lowest screened interval collected from 10.5 to

12.0 feet. All samples were collected on April 24. The bottom of the well was set at 15.0 feet. The boring was sealed after completion with a Portland cement/bentonite grout to the surface.

The well location was moved 15 feet west of the original boring because antifreeze and grease were accidentally introduced into the boring at a depth of approximately 40 feet below ground level. The antifreeze was flushed out of a hose used to add water to the boring to overcome sand blow-in. Approximately 500 ml of antifreeze was added to the boring. Grease was also noted on the hose fitting which may have contacted the augers. All soil samples for chemical analysis were collected from this boring by this depth so the boring was continued to bedrock. The boring, however, was deemed by Baker and EEI representatives as unfit for well installation. The augers used to redrill the monitor well boring were steam cleaned prior to drilling the second boring.

2.4 Monitor Well Installation Procedures

Monitor wells were installed in the four borings labelled as MW-A, MW-B, MW-C and MW-D. The same basic procedure was followed for the installation of all four wells. Borings were completed with 3-3/4 IDHSA to a depth approximately five feet below the encountered water table. Well installation followed immediately. Specific construction details and depths are noted in the boring logs and well construction detail forms in Appendix A.

All casing, couplings and screens were made of 316 stainless steel, with a 2-inch inside diameter. Screens were five foot lengths and slotted, wire-wound with a slot size of 0.01 inch.

The monitor well string was emplaced within the auger and the sand pack back-fill added. Synchronized addition of the sand pack and removal of the auger string took place in small increments (approximately 1-foot units). The sand pack was terminated approximately one foot above the top of the monitor well screen. Once the sand pack was in place, a bentonite pellet seal was added to a minimum thickness of two feet. The thicknesses of the sand pack and bentonite seal were determined through use of weighted, steel measuring tape.

Once the bentonite pellet seal was emplaced, the borehole annulus was grouted with an expanding cement mixture with 5 percent bentonite. The grout mixture was incrementally added through a tremie line as the augers were removed. The borehole annulus was grouted to a point above the ground surface and then mounded to shed surface water. A steel protector pipe was emplaced in this grout cap and fitted with a hinged lid and secured with hasp and keyed lock. The grout was checked for settling and recapped in the same manner.

The source of water used in the well construction, including drilling, grouting, sealing, purging, well installation, well development and equipment washing was approved prior to its use by the IEPA Project Manager. The water was taken from the Vandalia City Water supply, which came from the Kaskaskia River. Chlorination could not be by-passed, so the water was tapped from spigots at the Van Tran facility.

The wells were developed shortly after construction was completed. It was done after waiting a 48 hour period for water level stabilization. A teflon, bottomfilling/discharging bailer was used to clear sediments and remove a

minimum of five well casing volumes. A surging action was used to free settled sediments and loosen fines from the sand pack. All wells cleared substantially after 5-10 volumes were removed.

The liquid and sediments removed from the development of the monitor wells were collected and contained in a 55-gallon drum. This drum was stored for later disposal.

2.5 Ground Water Sample Collection

The four monitor wells were sampled by Baker/TSA on May 13, 1987, with oversight by EEI and IEPA personnel. This was approximately 2-1/2 weeks after completion of well development. A teflon bailer was used to purge and sample each well. Wells were purged of at least five well casing volumes prior to sampling. Purge water was collected and contained in a 55-gallon drum. Samples were placed in bottles provided by Gulf Coast Labs for analysis by GCL. No splits were collected by the IEPA/EEI representatives. Sample filtering and preservation was carried out immediately following collection in the Van Tran temporary office. Field measurements, including temperature, pH, and electrical conductance were measured at this time. A summary of these measurements and other well characteristics is given in Table 1.

Samples were placed in coolers and iced down after sealing each bottle with Custody seals. The cooler was then sealed and picked up by Federal Express that day for shipment to GCL for analysis. The IEPA/EEI representatives signed as witness to the custody sheets.

2.6 Sediment Sampling

Twelve sets of off-site sediment samples were collected from Town Branch Creek by EEI and IEPA personnel on May 13, 1987. Sampling locations are shown on Figure 2. These samples were analyzed for PCBs.

All samples were obtained from areas of sediment deposition. Each sample was a composite of 3 to 5 subsamples taken within a 10 foot stream reach at each sample site. All but sample No. 4 were obtained with stainless steel spoons. No. 4 was obtained with a stainless steel soil probe. Subsamples were placed in stainless steel pans and field composited with stainless steel spatulas at each site. They were placed in 32 ounce, pre-cleaned glass containers supplied through the IEPA CLP. Sites were sampled in the order 12, 11, 10, 9, 8, 1, 7, 6, 3, 2, 4, 5. Descriptions of the sites and activities follow:

Site 1. Drainage ditch along RR tracks to N of site. Light brown medium sand. Dry.

Site 2. Roadside drainage ditch to NE of site. Light brown sandy silt. Dry.

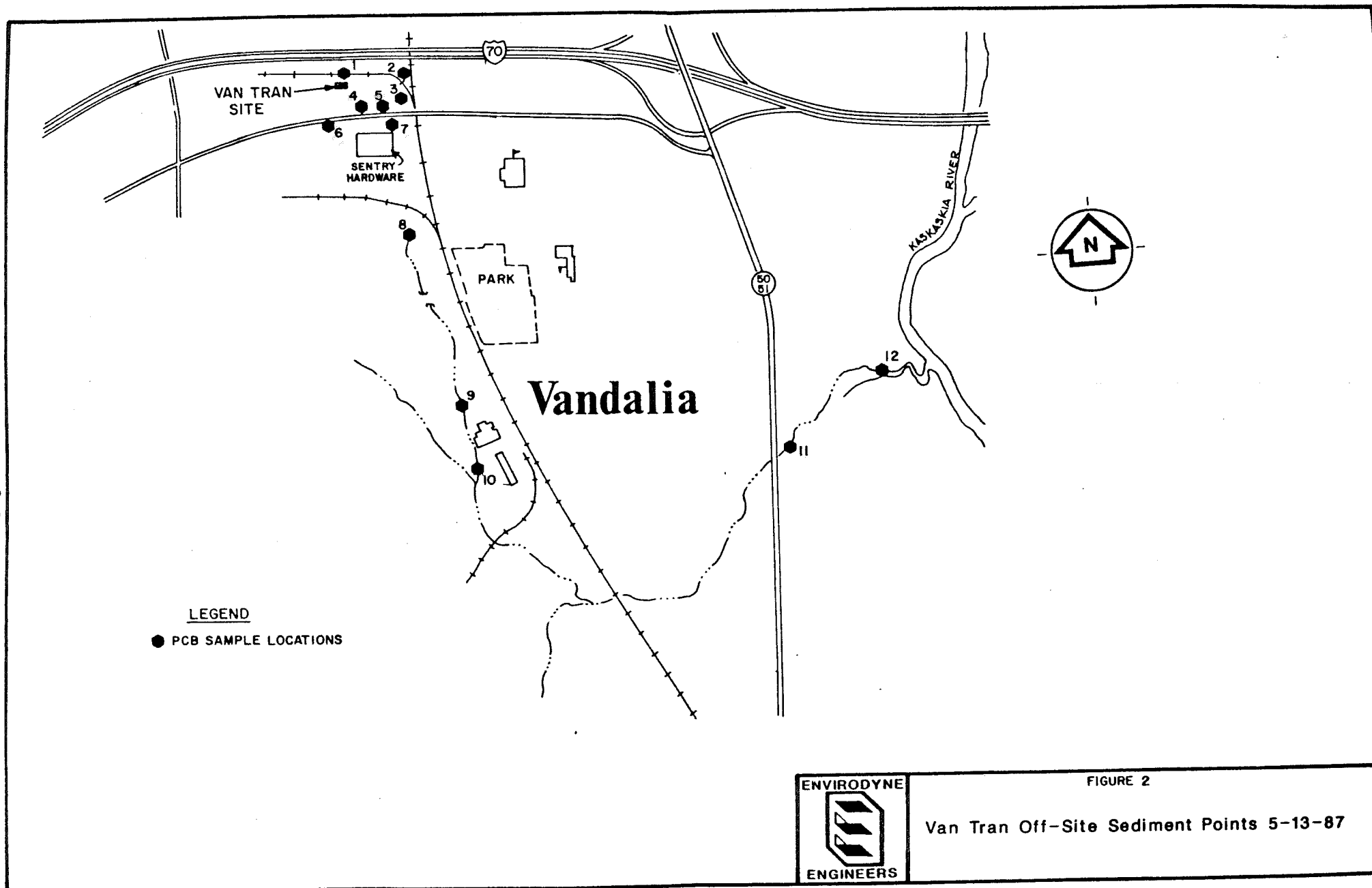
Site 3. Drainage ditch below confluence of streams from sites 1 and 2. Light brown sandy silt. Dry.

Site 4. Drainage ditch from east side of site along south side of Ray's Excavating. Light brown silt. Dry. Compacted; obtained with soil probe.

TABLE 1

GROUNDWATER SAMPLE COLLECTION SUMMARY

Well No.	Sample Date	Depth to Water (Ft-bgl)	Elevation of Water (ft-msl)	Volume Removed (gal)	pH	Electric Cond. (umhos/cm)	(OE)	Sample No.
MW-A	5/13/87	18.27	511.76	10.0	7.39	1000	65	3002
MW-B	5/13/87	17.16	511.78	4.0	7.29	700	64	3003
MW-C	5/13/87	16.00	511.74	3.0 dry	7.15	900	61	3001
MW-A	5/13/87	18.27	512.42	12.0	7.14	700	58	3000



Site 5. Deposition area below confluence of 3, 4. Brown silt. Ponded water.

Site 6. Drainage ditch from west side of site to south of Van Tran Avenue. Light brown silt. Dry. Obtained from mouths of culverts under Van Tran Avenue and entry road to Purina.

Site 7. Ponded deposition area below confluence of streams from sites 5 and 6. Brown silt.

Site 8. Large alluvial fan, approximately 200 yards to north of City Park. Brown silt. Stream flowing at this point.

Site 9. Central part of City Park. Three distinctly different groups of sediments in this area - (1) brown sand with intermixed detritus in central channel, (2) brown silt on top 1 to 1-1/2" with layer of dark brown organic muck on "outsides" of meanders, bluish-gray clay with 1/4 to 1/2" of brown silt on top to "insides" of meanders. Attempted to obtain equal aliquots of each.

Site 10. South end of City Park immediately upstream from confluence of Town Branch and a residential drainage stream from the west. Brown silt.

Site 11. Immediately downstream (east) of Highway 51. Brown clayey silt.

Site 12. Approximately 100 yards to west of confluence of Town Branch and Kaskaskia River, to inside (deposition side) of meander. Bluish-gray clayey silt with conspicuous iron nodules and septic odor.

Packing and shipment of samples were carried out as described for the groundwater samples in Section 2.5.

2.7 Sample Identification Summary

Each sample collected by Baker/TSA during this site investigation was assigned a number in the following procedure. Samples 1000 thru 1004 were PCB wipe samples. Samples labelled 2000 through 2003 were surficial soil samples, and 2004 through 2053 were soil boring samples. Samples 3000 thru 3003 were ground water samples from wells MW-A, B, C and D. Samples 3004 through 3010 were from decontamination liquid in drums. The samples labelled 1 thru 12 were collected from off-site drainage locations by EEI and analyzed only for PCBs. Table 2 lists these samples in summary form.

2.8 Decontamination Procedures

All equipment (augers, split spoons, samplers, drill rods, etc.) which came in contact with the borehole was thoroughly steamed cleaned and solvent rinsed between borings. Water used during the installation and decontamination phases of this task was from the approved source.

The rinsing sequence was as follows: gross removal of cutting from tools into drums, steam cleaning of tools over a portable steel pond, rinsing with acetone, and a final steam cleaning with the approved water. All water used in the rinsing and steam cleaning was contained and stored on-site in a designated area in sealed DOT 17H/55-gallon drums.

TABLE 2
VAN TRAN SAMPLE COLLECTION SUMMARY

DESIGNATED SAMPLE NUMBER	IEPA SPLIT NUMBER	DATE COLLECTED	ORIGIN OF SAMPLE	ANALYTES	LAB ANALYZING
1000		4/20/87	Wipe sample -3 steel beams	PCB	Gulf Coast (GCL)
1001		4/20/87	SW elevated pad	PCB	GCL
1002		4/20/87	W half burning pad	PCB	GCL
1003		4/20/87	E half burning pad	PCB	GCL
1004		4/20/87	Tank area - S pad	PCB	GCL
2000		4/21/87	Gravel driveway	PCB, metals, BNA	GCL
	2000A	4/21/87	Gravel driveway	Full	ARDL, Inc.
2001		4/21/87	West of pad-soil	Full, (no VOA)	GCL
2002		4/21/87	NE corner drainage	Full, (no VOA)	GCL
2003		4/21/87	Central pad sediments	PCB	GCL
2004		4/21/87	MWA 0-1.5 feet	Full	GCL
	2004A	4/21/87	MWA 0-1.5	Full	ARDL, Inc.
2005		4/21/87	MWA 4.5-6.0	Full	GCL
2006		4/21/87	MWA 9.0-10.5	Full	GCL
2007		4/21/87	MWA 13.5-15.0	Full	GCL
2008		4/21/87	MWA 18.0-19.5 (screen)	Full	GCL
	2008A	4/21/87	MWA 18.0-19.5 (screen)	Full	ARDL, Inc.
2009		4/22/87	MWC 0-1.5	Full	GCL
2010		4/22/87	MWC 4.5-7.5	Full	GCL
2011		4/22/87	MWC 9.0-10.5	Full	GCL
2012		4/22/87	MWC 12.0-13.5 (duplicate screen)	Full	GCL
2013		4/22/87	MWC 12.0-13.5 (duplicate screen)	Full	GCL
2014		4/23/87	MWB 0-1.5	Full	ARDL, Inc.
2015		4/23/87	MWB 4.5-6.0	Full	ARDL, Inc.
2016		4/23/87	MWB 9.0-10.5	Full	ARDL, Inc.
2017		4/23/87	MWB 13.5-15.0 (screen)	Full	ARDL, Inc.
2018		4/23/87	Boring C 0-1.0	Full	ARDL, Inc.
2019		4/23/87	Boring C 1.0-2.0	Full	ARDL, Inc.
2020		4/23/87	Boring C 2.0-3.0	Full	ARDL, Inc.
2021		4/23/87	Boring C 3.0-4.0	Full	ARDL, Inc.
2022		4/23/87	Boring C 4.0-5.0	Full	ARDL, Inc.
2023		4/23/87	Boring C 5.0-6.0	Full	ARDL, Inc.
2024		4/23/87	Boring C 6.0-7.0	Full	ARDL, Inc.
2025		4/23/87	Boring D 0-1.0	Full	GCL
2026		4/23/87	Boring D 1.0-2.0	Full	GCL
2027		4/23/87	Boring D 2.0-3.0	Full	GCL
2028		4/23/87	Boring D 3.0-4.0	Full	GCL
2029		4/23/87	Boring D 4.0-5.0	Full	GCL
2030		4/23/87	Boring D 5.0-6.0	Full	GCL
2031		4/23/87	Boring D 6.0-7.0	Full	GCL
2032		4/24/87	MWD 0-1.5	Full	GCL
2033		4/24/87	MWD 4.5-6.0	Full	GCL
2034		4/24/87	MWD 9.0-10.5	Full	GCL
2035		4/24/87	MWD 12.0-13.5 (screen)	Full	GCL
2036		4/27/87	Boring A 0-1.0	Full	GCL

TABLE 2
VAN TRAN SAMPLE COLLECTION SUMMARY
(Continued)

DESIGNATED SAMPLE NUMBER	IEPA SPLIT NUMBER	DATE COLLECTED	ORIGIN OF SAMPLE	ANALYTES	LAB ANALYZING
2037	2036A	4/27/87	Boring A 0-1.0 feet	Full	ARDL, Inc.
2038		4/27/87	Boring A 1.0-2.0	Full	GCL
		4/27/87	Boring A 2.0-5.0	Full	GCL
2039	2038A	4/27/87	Boring A 2.0-5.0	Full	ARDL, Inc.
2040		4/27/87	Boring A 5.0-8.0	Full	GCL
		4/27/87	Boring A 5.0-8.0 (duplicate)	Full	GCL
2041		4/27/87	Boring A 8.0-9.0	Full	GCL
2042		4/27/87	Boring A 9.0-10.0	Full	GCL
2043		4/27/87	Boring A 10.0-11.0	Full	GCL
2044		4/27/87	Boring A 11.0-12.0	Full	GCL
2045		4/27/87	Boring B 0-1.0	Full	GCL
2046		4/27/87	Boring B 1.0-2.0	Full	GCL
2047		4/27/87	Boring B 2.0-5.0	Full	GCL
2048		4/27/87	Boring B 2.0-5.0 (duplicate)	Full	GCL
2049		4/27/87	Boring B 5.0-8.0	Full	GCL
	2049A	4/27/87	Boring B 5.0-8.0	Full	ARDL, Inc.
2050		4/27/87	Boring B 8.0-9.0	Full	GCL
2051		4/27/87	Boring B 9.0-10.0	Full	GCL
2052		4/27/87	Boring B 10.0-11.0	Full	GCL
2053		4/27/87	Boring B 11.0-12.0	Full	GCL

TABLE 2
VANTRAN SAMPLE COLLECTION SUMMARY
(Continued)

DESIGNATED SAMPLE NO.	DATE COLLECTED	ORIGIN OF SAMPLE	ANALYSIS	LAB
1	5/13/87	Drainage ditch along railroad tracks north of site	PCB	ARDL, Inc.
2	5/13/87	Roadside drainage ditch-northeast of site	PCB	
3	5/13/87	Drainage ditch below confluence of 1,2	PCB	
4	5/13/87	Drainage ditch from east side of site	PCB	
5	5/13/87	Ditch below confluence of 3,4	PCB	
6	5/13/87	Drainage ditch from west side of site	PCB	
7	5/13/87	Ditch below confluence of 5,6	PCB	
8	5/13/87	Town Branch Ck. 200 yds north of City park	PCB	
9	5/13/87	Town Branch Ck. center of City park	PCB	
10	5/13/87	Town Branch Ck. south end of City park	PCB	
11	5/13/87	Town Branch Ck. below Highway 51	PCB	
12	5/13/87	Town Branch Ck. 100 yds upstream from confluence west of Kaskaskia River	PCB	
3003	5/13/87	Monitor Well D	Full	GCL
3001	5/13/87	Monitor Well C	Full	GCL
3002	5/13/87	Monitor Well A	Full	GCL
3003	5/13/87	Monitor Well B	Full	GCL
3004	5/14/87	Decontaminated water - drum 1	Full	GCL
3005	5/14/87	Decontaminated water - drum 2	Full	GCL
3006	5/14/87	Decontaminated water - drum 3	Full	GCL
3007	5/14/87	Decontaminated water - drum 8	Full	GCL
3008	5/14/87	Decontaminated water - drum 5	Full	GCL
3009	5/14/87	Decontaminated water - drum 9	Full	GCL
3010	5/14/87	Decontaminated water - drum 10	Full	GCL

TABLE 2
VANTRAN SAMPLE COLLECTION SUMMARY
(Continued)

Note: "Full" includes GC/MS target organic compounds with VOA, BNA, PCB, pesticides, metals

Totals: Samples analyzed by Baker/GCL = 55
Samples analyzed by IEPA/ARDL = 16 (includes 6 splits)
Off site PCB in soils analyzed by ARDL = 12

The steam cleaning area was set up near each boring location to better serve the drill crew. Hand tools were cleaned in a similar fashion, but not steam cleaned. Generally, they were scrubbed in detergent water and then rinsed as described.

All drilling cuttings were contained in the drums and stored on-site in the designated area.

2.9 Hazardous Materials Containment

All potentially hazardous materials produced or displaced during the site investigation were drummed in 55-gallon 17-H DOT steel drums. All drill cuttings, decontamination water, development and purge water from the wells, and disposable protective equipment was placed in these drums.

A temporary storage area consisting of a large tarp of plastic, bermed on all four sides by bricks and 2 inch by four inch wood boards was constructed. The drums were labelled as to their contents and placed in the storage area with the aid of Van Tran's fork lift. Figure 3 shows the general layout of the containment system. It was set up on the concrete pad west of the large side building. Twelve drums were collected including:

- 7 - decon water
- 3 - soil cuttings
- 1 - monitor well purge and development water
- 1 - miscellaneous disposable protective equipment

The 7 drums containing the decontamination water were sampled by Dan Bradfield of Baker/TSA on Thursday, May 14, 1987. The drums' contents were analyzed for disposal criteria. Results are listed in Appendix C for samples labelled 3004-3010.

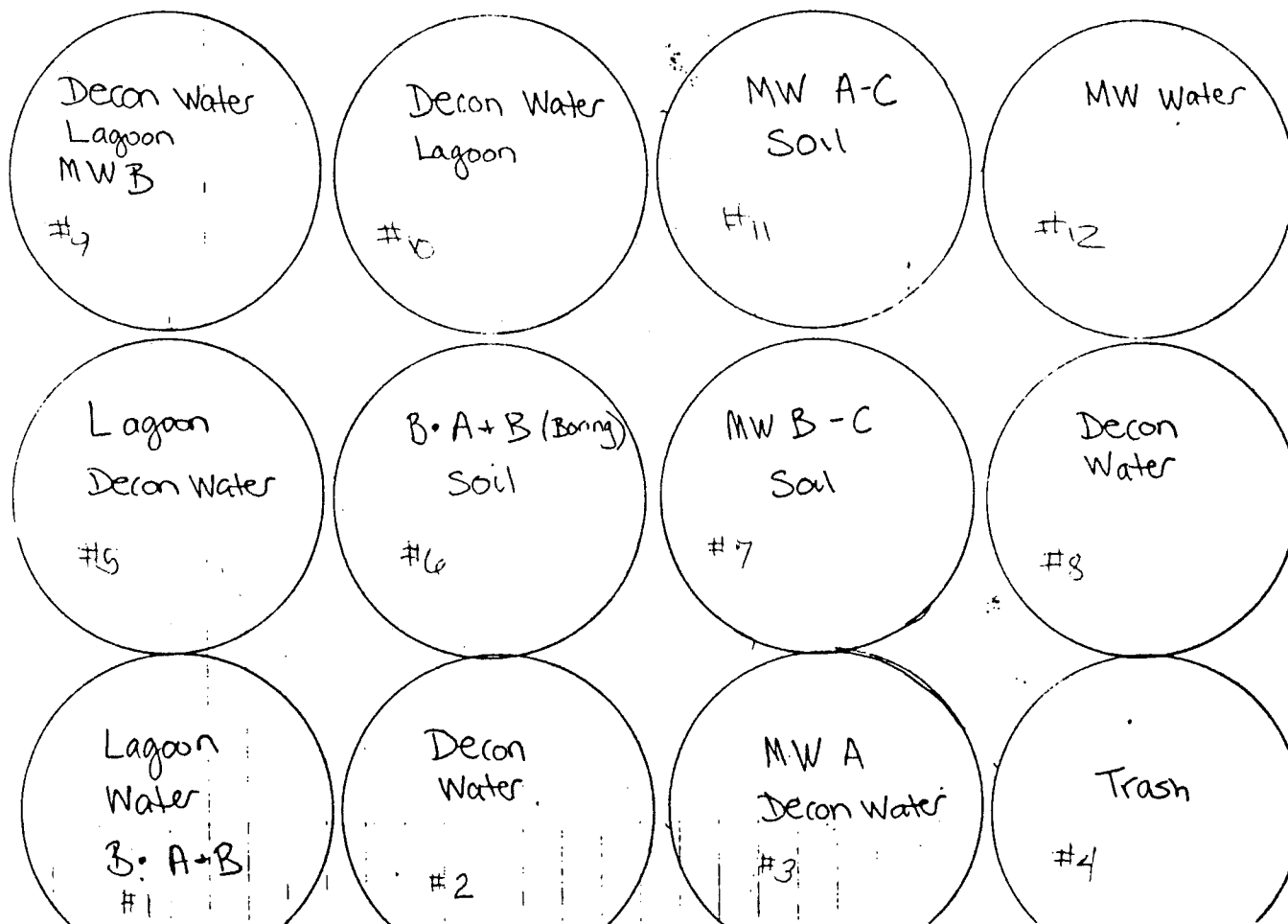
Drum Storage Area

4/28/87

9' 3" →

7' 2" ↓

N ←



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FIGURE 3

DRUM STORAGE AREA

3.0 ANALYTICAL RESULTS

All analytical results received by Envirodyne Engineers, Inc. (EEI) from either ARDL, Inc. or Gulf Coast Labs, Inc. were evaluated in the following discussion. As noted in the previous section, the samples were split between these two laboratories for quality control measures and because the number of samples collected exceeded those originally planned for by Van Tran and Baker/TSA in the consent plan.

Appendix C contains summaries of the analyses conducted by both laboratories. They are arranged first by parameter area; i.e., metals, PCBs, volatiles, BNA, and library search findings for soils, and groundwater. Within each area the samples are further segregated by laboratory and then numbered consecutively by sample identifier. This summary lists only positive values for the analyzed parameters. This summary was prepared by EEI from the laboratory submittals which IEPA sent to EEI. Full analytical results were also entered and are listed in Appendix D. These show all results, including values less than detection limit, for the analyzed parameters. Appendix D is arranged in the same manner as the positive listings discussed previously.

3.1 Wipe Samples

The analysis of the wipe samples indicate sites 1002, 1003, and 1004 to contain significant concentrations of PCBs. The primary arochlor is 1260. Values included 5280 ug/100cm² (1002), 4750 ug/100 cm² (1003) and 3670 ug/100 cm² (1004). Two samples represent the burning pad at the rear (north) end of the concrete pad (1002 and 1003). Sample 1004 was collected from the pad area directly in front of the small volume, elevated storage tanks, north of the main building. Sample 1001 had a value of 12 ug/100 cm². This sample represents a stained area of an elevated concrete pad, north of the main concrete pad.

3.2 Surficial Soil Samples

Four surficial soil samples were collected from four drainage collection points across the Van Tran property. These have been labelled as sample numbers 2000 through 2003. Their locations are shown in Figure 1. These areas generally represent the upper six inches of soil.

Sample 2000 represents Site 1 of the EEI Sampling Plan. It represents a gravelled driveway south of the buildings in a low area, collecting runoff from the concrete pad and other areas of the plant. This site had PCB concentrations of 10 mg/kg, but no other significant analyzed parameters.

Sample 2001 represents drainage accumulation from the northeast quarter of the plant. This represents Site 2 of the EEI Sampling Plan. PCB concentrations were found to be 48 mg/kg and 14 mg/kg for aroclors 1248 and 1260, respectively. No other significant results were detected in this sample.

Sample 2002 represents an area west of the concrete pad in low areas which would likely receive drainage from the concrete pad. It was originally designated Site 3 in the Sampling Plan. This sample had a value of 10 mg/kg PCB of Aroclor 1260. Metals, including chromium (11.4 mg/kg), copper (23.8 mg/kg), and vanadium (22.2 mg/kg) were elevated above other soil sample values collected in the area. No other parameters had significant results.

Sample 2003 was collected from a low lying area in the center of the concrete pad. This site was originally intended as a PCB wipe sample, but due to the large accumulation of sediment dust and fine materials, it was collected as a soil sample. This sample was found to contain 50 mg/kg and 124 mg/kg of PCBs in the form of Aroclor 1248 and 1260, respectively. No other significant levels of other parameters were detected.

3.3 Soil Borings

Samples were collected from the four borings used to install monitoring wells (MWA, MWB, MWC and MWD) as well as four borings in suspect areas for analytical samples only (B-A, B-B, B-C, B-D). The locations of each sample, numbered by Baker as 2004-2053, are shown in Figure 1, along with the associated boring location.

Samples from the monitor well A (MWA) boring at the north boundary center line of the plant (2004-2008) showed no elevated levels of the analyzed parameters.

Samples from the boring for monitor well B (2014-2017), located at the northwest corner of the Van Tran property showed low levels of volatile organic contamination. These compounds include 2-butanone (11 ppm), toluene (2.3 ppm), trace levels of xylenes and phthalates. The organic contamination was detected primarily in the 4.5-6.0 foot interval (2015) and the 9.0-10.5 foot interval (2016). Low level PCB contamination (<1 mg/kg) was detected in all four samples from this boring.

The boring from monitoring well C, at the northeast corner of the facility was sampled at five intervals (2009-2013). Low levels of PCB contamination (<1 mg/kg) were detected in the 9.0-10.5 foot interval in sample 2011. In addition, elevated levels of chromium (22.1 mg/kg) and vanadium (25.8 mg/kg) were detected in the top interval 0-1.5 feet (2009).

Samples from MW-D boring (2032-2035), located across the highway in an up-gradient position, indicated no elevated levels for any of the analyzed parameters.

The remaining soil samples were collected from 4 borings, A-D. Locations for these borings were selected to intercept potential contamination from likely sites.

Borings A & B were drilled in an area described as a waste disposal pit. It is located in the north lot behind the main facility, north of the burning pad. Boring A sampled the western side of this pit, while boring B sampled the eastern side. Both borings were taken to a depth estimated as one-foot above top of the water table. This depth was estimated at 12.0 feet for both borings.

Boring A (2036-2044) was found to have high levels of contamination in the form of volatile organic compounds, PCBs, phthalates, and a long list of library-list semivolatile compounds. Primary contaminants and peak concentrations include 2-Butanone (200 ug/kg), toluene (850 ug/kg), ethylbenzene (32 ug/kg), and xylenes (120 ug/kg). These compounds were concentrated in the 2.0 to 5.0 foot interval (2038) and gradually declined to trace levels (less than 1 ug/kg) at approximately 9.0 feet. The same general pattern of

concentration was seen for the library search compounds, including trichlorinated biphenyls, trimethyl benzenes, unknown hydrocarbons, and xylenes. PCBs were detected in this boring at levels of 72 mg/kg at the surface, gradually decreasing to 15 mg/kg at 5 feet.

Boring B (2045-2053) was found to display a similar contamination pattern as seen in Boring A. The same contaminants were detected, including 2-butanone (92 ug/kg), toluene (31 ug/kg), ethylbenzene (0.34 ug/kg), xylenes (2.6 ug/kg), but in lower concentrations. These compounds were concentrated in the 5.0-8.0 foot interval, but also found as shallow as 2.0 feet, and as deep as 11.0 feet. PCBs were detected in this boring to 8 feet. Levels were concentrated in the 1.0-5.0 foot zone with concentrations of 69 mg/kg at 1-2 feet (2046) to 30 mg/kg in the 2-5 foot zone (2047). Semivolatile library search compounds were concentrated in the 5.0 to 8.0 foot interval.

Boring C was drilled in the drainage swale at the southeast corner of the Van Tran property. It was sampled to a depth of one-foot above the estimated water table, which came to 7.0 feet below ground level. The boring was split into one-foot increments for sampling (2018-2024). Low levels of benzene, ethyl benzene, xylenes, toluene, and 1,1-dichloroethane were detected throughout the boring depth. There was no discernible decrease in concentration through depth, and concentrations of these contaminants ranged from less than 1 ug/kg to 5 ug/kg. PCB contamination at this site was significant. Very high levels of PCB-1242 and -1260 were detected from the surface to the last interval sampled (6.0-7.0'). Concentrations of PCB-1260 ranged from 2000 to 100 mg/kg, with no discernible variation in depth. The concentrations were well distributed. Concentrations of PCB-1242 were generally lower and had a trend of reducing concentrations with depth. Concentrations ranged from 210 mg/kg at the peak interval of 4.0-5.0 feet (2022) to the lowest value of 10 mg/kg in the 6.0 to 7.0 foot interval (2024).

Boring D was drilled to 7.0 feet at the southwest corner of the Van Tran property. It is represented in foot sampling increments labelled 2025-2031. There were no elevated levels of analyzed parameters detected in these samples.

3.4 Off-Site Sediment Samples

Twelve sediment samples were collected from drainage ways around the Van Tran property and the extended drainage (Town Creek) followed through town to the confluence with the Kaskaskia River. Samples 1-5 represent local drainage from the Van Tran property. The remaining samples trace this drainage to the treatment plant adjacent to the Kaskaskia River. These samples were analyzed for PCBs only.

Samples 1 and 2 showed no contamination with PCBs. Sample 3 had a level of 3.6 mg/kg. This sample represented drainage from Van Tran along the north side and possible back water flooding zones during heavy rain from the southern Van Tran drainage. Sample 4 had the highest concentrations of PCBs of the off-site samples, with 230 mg/kg of PCB-1242 and 450 mg/kg of PCB-1260. Sample 4 represented an area in front of Ray's Excavating Services, approximately 500 feet east of Boring C on Van Tran's property.

Sample 5 had lower concentrations of PCB 1260 with a concentration of 5.4 mg/kg. Sample 5 represented the confluence of streams sampled by points 3 and 4.

Sample 6 had a PCB-1260 concentration of 4.2 mg/kg. This point was chosen to represent drainage from Van Tran as it flows off site from the southeast corner of the property. Sample 7 had detectable concentrations of less than 1 mg/kg PCB-1260. This point represented the confluence of points 6 and 5.

Sample points 8 and 9 showed no detectable PCB concentrations. Point 10 had a concentration of less than 1 mg/kg of PCB-1260. Sample 11 had a PCB-1242 concentration of 11 mg/kg. This sample, however, had many other inputs to the sediment load between it and the previous point. Sample 12 had no detectable PCB concentration.

3.5 Groundwater Samples

The four monitor wells sampled by Baker/TSA and Van Tran were MW-A, MW-B, MW-C, and MW-D. These wells were constructed of stainless steel and installed according to IEPA specifications, and EEI observation. According to the analyses, only well MW-B, at the northwest corner of the property, showed indications of contamination. Toluene was detected in this well in a concentration of 10 ug/l. No other elevated levels were detected for any analyzed parameters.

Water levels were recorded for each well prior to sampling, as well as at previous times during the investigation. Table 3 summarizes the results of these readings in the form of water table depths and elevations. The measurements taken on 4/7, 4/24, 4/28 and 5/13 were done by Baker/TSA with EEI observing. The measurement on 7/30 was conducted by IEPA Collinsville field office personnel.

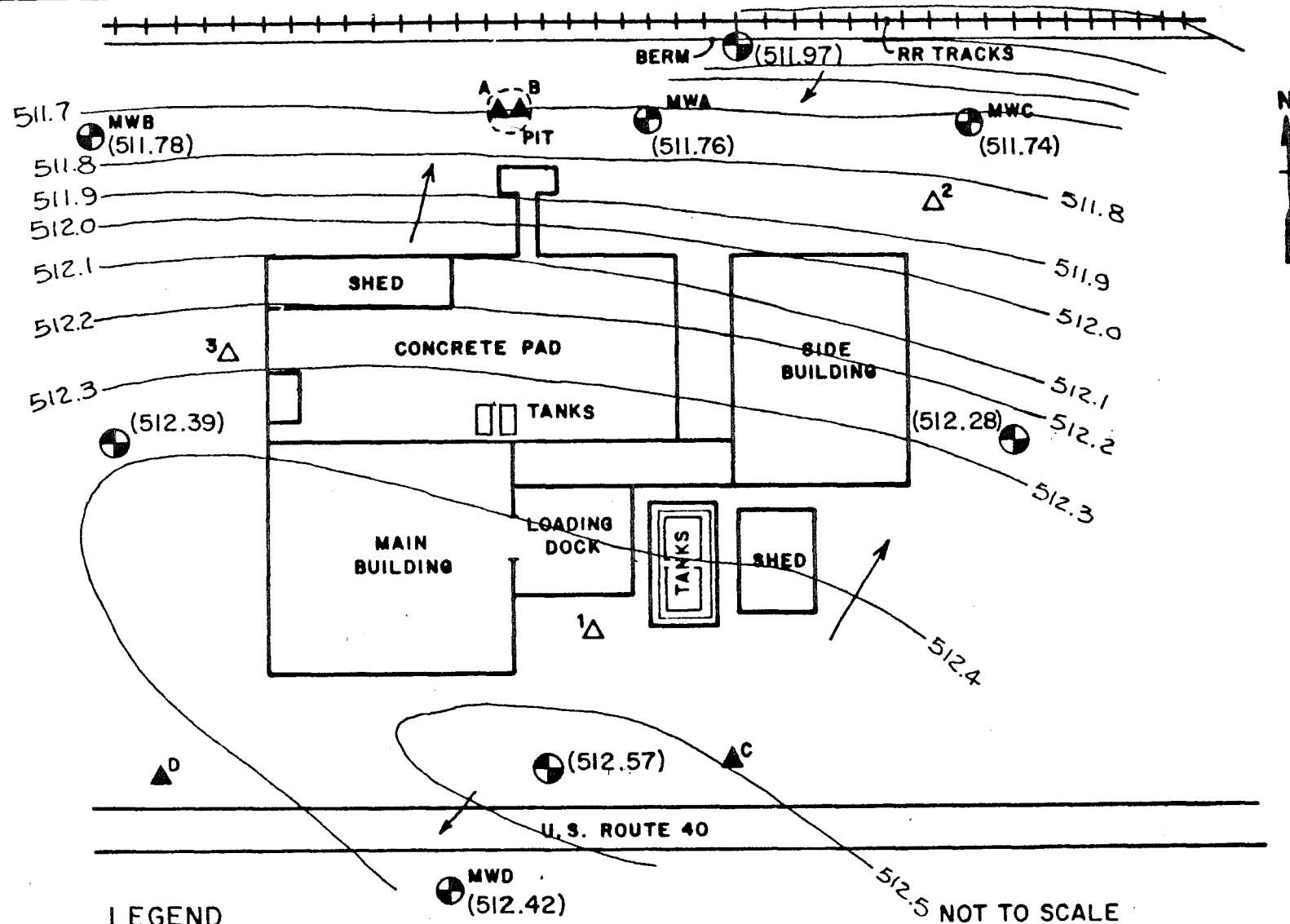
A surveyed map was not provided to EEI for well locations. Figures 4 and 5 show water table configurations based upon measurements on two different days. These included the sample collection date of 5/13/87, and two months later, July 30, 1987 by IEPA personnel. A general northeast component to groundwater flow is evident across the Van Tran property. There appear to be two minor inconsistencies to this pattern to note. A slight mounding condition may be evident near the north boundary of the plant caused by the gravel and sand glacial formation crossing the property at this point. Along the southern boundary, flow appears to reverse direction to the south. Since only two wells in this area were used to monitor flow, no conclusions can be made regarding this phenomenon. In either case, however, these measurements indicate general flow across the Van Tran site to be north by northeasterly and MW-D to be upgradient of the site.

TABLE 3
WATER LEVEL MEASUREMENTS

Well No.	Elevation Top of Casing	Elevation Ground	4/7/87		4/24/87		4/20/87		5/13/87		7/30/87	
NEW												
A-North	530.03	526.25	*	*	18.18	511.85	18.20	511.83	18.27	511.76	18.63	511.40
West	528.94	526.70	*	*	17.00	511.94	17.20	511.74	17.16	511.78	17.37	511.57
C-East	527.74	524.79	*	*	15.90	511.84	15.85	511.89	16.00	511.74	16.27	511.47
South	523.02	520.27	*	*	*	*	17.80	505.22	10.60	512.42	10.86	512.16
OLD												
West	527.76	525.50	15.33	512.43	-	-	15.35	512.41	15.37	512.39	15.61	512.15
North	531.33	528.70	19.25	512.08	-	-	19.35	511.96	19.34	511.97	19.61	511.70
3-East	527.19	524.00	14.58	512.61	-	-	14.83	512.36	14.91	512.28	15.21	511.98
South	523.98	521.00	11.04	512.94	-	-	11.35	512.63	11.41	512.57	11.69	512.29

*Not yet drilled

Not measured



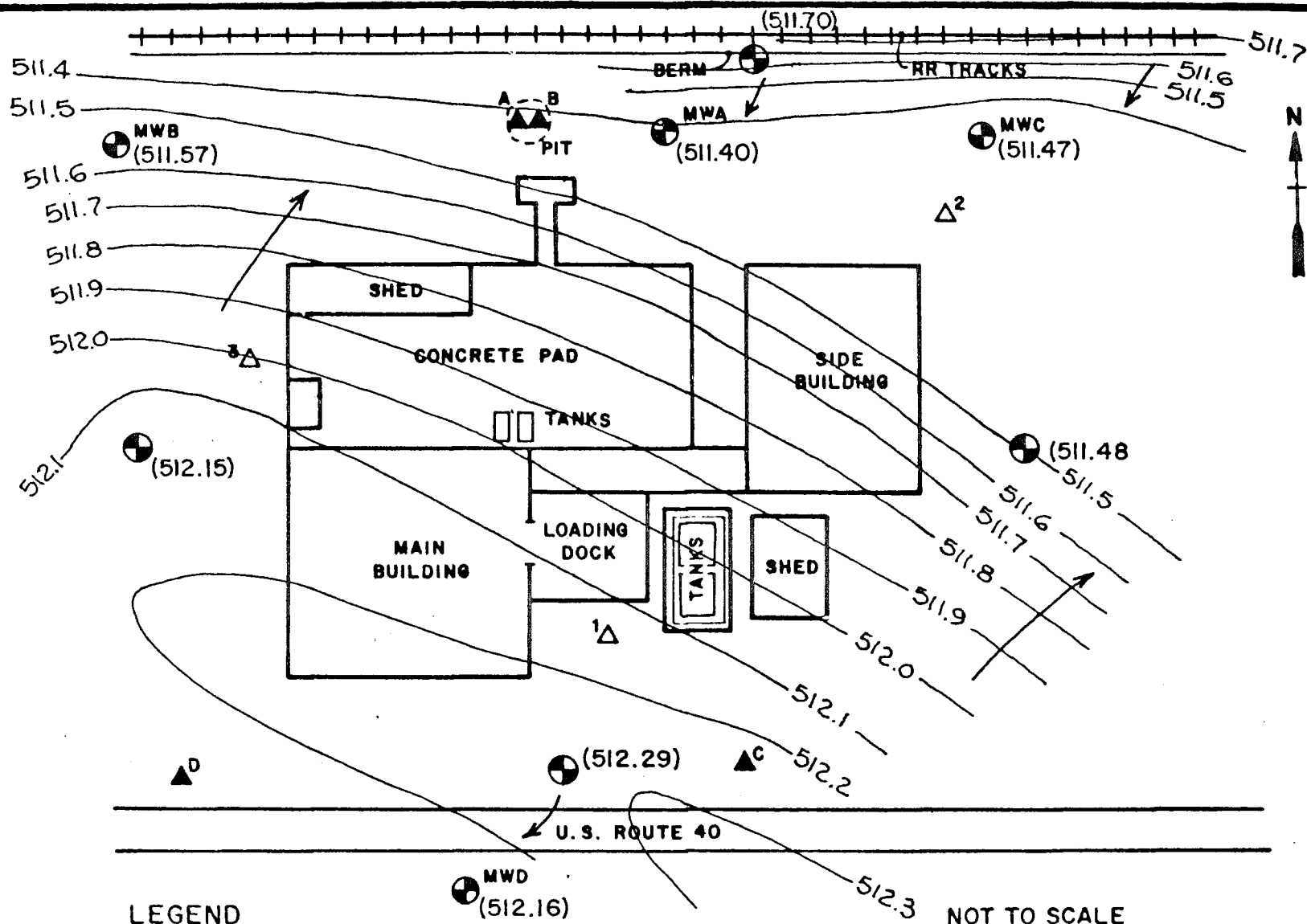
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FIGURE 4

Estimated Water Table-Measured 5-13-87
VAN TRAN ELECTRIC



LEGEND

- WELL (APPROX. LOCATION)
- ▲ BORING
- △ SURFACE DRAINAGE

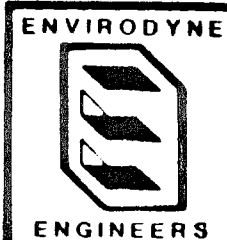


FIGURE 5

Estimated Water Table-Measured 7-30-87
VAN TRAN ELECTRIC

4.0 INVESTIGATION CONCLUSIONS

Work conducted by Baker/TSA for Van Tran, Inc. as observed by EEI appears to be in general compliance with the consent plan. The exceptions include the use of a solvent lubricant (WD-40) on the hollow stem augers at MW-B and the accidental spilling of antifreeze into the boring for MW-D. These situations were corrected to the satisfaction of the EEI observer and are fully described in Section 2.3.3.

Contamination at the Van Tran site appears as two basic conditions. Soil and wipe samples for PCBs indicate widespread surficial contamination by PCB-1260, 1242 and 1248 aroclors. In two areas sampled, significant PCB contamination could be detected to at least 7 feet below ground level. Off-site PCB samples indicate the movement of PCBs off the Van Tran property via drainage ways. PCB contamination can be traced from the plant boundaries to a point south of the bordering Highway 40. Levels of PCB contamination on site have been detected as high as 2000 mg/kg in the drainage area sampled by Boring C, and off site as high as 450 mg/kg (point 4).

Borings further indicate two areas of significant contamination by organic compounds; including toluene, 2-butanone, ethylbenzene, xylenes, and various other library search detected compounds. Contamination by these compounds was detected as deep as 11.0 feet in the area known as the waste disposal pit, sampled by borings A and B. Boring C indicated contamination by these same compounds in lower concentrations to the extent of the boring depth at 7.0 feet.

Groundwater samples indicated only well MW-B to contain analyzed contaminants. It was found to contain 10 ug/l toluene. All other wells were below detection limit.



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FIELD BORING LOG

Sheet 1 of 1

FOR Van Tran Electric/IEPA

JOB NO. 3059-30000

LOCATION (West 1/2 of pit) - Vandalia, Illinois

ELEV.

BORING NO. A

WHILE DRILLING Not encountered				DATE 4-27-87		DRILL CO. PSI	
BEFORE DEVELOPMENT				TIME START 9:50		DRILLER Fernandez	
AFTER DEVELOPMENT				TIME END 12:30		LOGGER Cira	
SAMPLE NO.	BLOWS ON SAMPLER	DRIVE	RECOVERY	VISUAL FIELD CLASSIFICATION		S.S. Die 1 1/2"	GRAPHIC LOG
						Weight 140#	WELL CONSTRUCT
						Drop 30"	
2036	4	12	10	1	Medium brown sicl - sample HNU max 50 ppm		N/A
2037	7						
	8	12	12	2	Medium brown sicl - sample HNU max 60 ppm		
	9						
2038/2038A	6	18	18	3	Medium brown sicl - moist		
	8						
	10						
	6						
	12	18	18	4	becomming sandy HNU - 500-1000 last 1 - foot		
	8						
2039/2040	6			5	grey sandy clay, med. sand mixed - mottling		
	12	18	18	6	Sandy clay - reddish brown 50% sand 500-1000 ppm		
	18				Sandy clay - reddish brown 50-100 ppm		
	7						
	7	18	18	7	Reddish orange, medium sand 20-30 ppm		
	8						
2041	4	12	12	8	Reddish orange, medium sand 40-50		
	6						
2042	4	12	12	9	Reddish orange, medium sand avg. 7 max 50		
	4						
2043	3	12	12	10	Reddish orange, medium sand		
	4						
2044	4	12	12	11	Reddish orange, medium sand 5-10 ppm		
	4						
	4			12	Reddish orange, medium sand 0-2 ppm		
					E.O.B. = 12.0'		
					began pulling augers straight up, but it began to break ground 5' radius from boring resorted to turning augers while pulling.		
					Grouted boring through augers w/rig pump Mixed 1/2 bentonite, 1/2 cement. Approximately 1 bag @.		



ENGINEERS

FIELD BORING LOG

Sheet 1 of 1

FOR - Van Tran Electric/IEPA

JOB NO. 3059-30000

LOCATION Vandalia, Illinois (East 1/4 of pit)

ELEV. _____

BORING NO. B

GROUND WATER				WHILE DRILLING N/E	DATE 4-27-87	DRILL CO. PSI	
BEFORE DEVELOPMENT				TIME START 1:15 am	DRILLER Fernandez		
AFTER DEVELOPMENT				TIME END 2:50	LOGGER Cirra		
SAMPLE NO.	BLOWS ON SAMPLER	DRIVE	RECOVERY	VISUAL FIELD CLASSIFICATION	S.S. Dia 1 1/2" Weight 140# Drop 30"	GRAPHIC LOG WELL CONSTRUCT	REMARKS
2045	3 8	12	2x 8	1 Medium brown silty clay (2 drives for volume)		grouted to surface - no well	500 ppm in sple.
2046	9 7	12	10	2 Medium brown silty clay			500-600 ppm in sple.
2047-48 Dup.	7 7 9	18	18	3 Medium brown silty clay			300 ppm sple.
	4 5 8	18	18	4 Grading to increased sand			50-200 ppm sple. 15-10 in auger
	3 5 9	18	18	5 Sandy clay - orangish brown, stiff			80 ppm sple.
2049 & A	2 4 5	18	18	6 Clayey sand, orangish brown			3 ppm sple.
	2 3	12	12	7 Medium clayey sand			
	2050	2 6	12	12			9 Light yellow/red well sorted medium sand-loose
2051	7 3	12	12	10 Light yellow/red well sorted medium sand-loose			0 ppm sple.
2052	2 3	12	10	11 Reddish orange, well sorted medium sand - loose			5 ppm sple.
2053	4 4	12		12 Reddish orange, well sorted medium sand - loose			
				12.0' E.O.B.			



ENGINEERS

FIELD BORING LOG

Sheet 1 of 1

FOR Van Tran Electric/IEPA

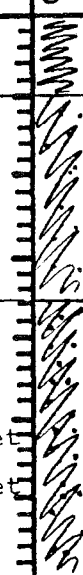
JOB NO. 3059-30000

LOCATION Vandalia, Illinois

ELEV. _____

BORING NO. C

GROUND WATER		WHILE DRILLING		DATE		DRILL CO.		
BEFORE DEVELOPMENT		Not encountered		4-23-87		PSI		
AFTER DEVELOPMENT				TIME START 2:46		DRILLER Fernandez		
				TIME END 3:30		LOGGER Cira		
SAMPLE NO.	BLOWS ON SAMPLER	DRIVE	RECOVERY	VISUAL FIELD CLASSIFICATION		S.S. Dia 1 1/2" Weight 140# Drop 30"	GRAPHIC LOG WELL CONSTRUCT	REMARKS
2018	5	12	8	1	Medium brown - silt - trace clay		grouded to surface	HNU: 20-30 ppm in hole 3 drives.
2019	4	12	6	2	Grey wet clayey sand			HNU: 200 ppm 2 drives
2020	2	12	10	3	Grey clay; wet			30 ppm
2021	6	12	12	4	Grey clay w/mottling; wet			38 ppm
2022	4	12	12	5	Stiff grey brown clay - orange mottling; wet			
2023	7	12	12	6	Grey to tan fine sand w/some clay			
2024	10	12	12	7	Grey sandy clay			65 ppm
		12	12	8	Tan fine sand, well sorted			
					7.0' E.O.B.			
					Water at 8.2			

GROUND WATER		WHILE DRILLING		DATE		DRILL CO.		
		Not encountered		4-23-87		PSI		
BEFORE DEVELOPMENT				TIME START 5:00 pm		DRILLER Fernandez		
AFTER DEVELOPMENT				TIME END 5:53 pm		LOGGER Cira		
SAMPLE NO.	BLOWS ON SAMPLER	DRIVE	RECOVERY	VISUAL FIELD CLASSIFICATION		S.S. Dia <u>1 1/2"</u> Weight <u>140#</u> Drop <u>30</u>	GRAPHIC LOG WELL CONSTRUCT	REMARKS
2025	5 4	12	8	1	Gravel fill in clay - medium brown		grouted	HNU readings
2026	4 4	12	8	2	Medium brown/grey silty clay, some sandy abund. Fe staining/mottles			Moved 15' East in ditch.
2027	4 5	12	12	3	No recovery - Same as above Moved location			
2028	4 4	12	10	4	Medium brown sandy clay (medium text sand)			
2029	6 5	12	12	5	Grey fine sandy silt - mottling - wet Moderate stiff loess			
2030	4 7	12	12	6	Occasional coarse sand, stiff, mottling -wet			
2031	11 11	12	12	7	Occasional coarse sand, stiff, mottling -wet			
				8	7.0' E.O.B.			
					Estimated water table 8.2' B.G.L. measured at southern most Monitoring Well in pm			

FOR Van Tran Electric - IEPA

JOB NO. 3059-30000

LOCATION Vandalia, Illinois

ELEV.

BORING NO. MW-A

GROUND WATER				WHILE DRILLING 15'		DATE 4-21-87		DRILL CO. PSI			
				BEFORE DEVELOPMENT		TIME START 3:00 am		DRILLER Fernandez			
				AFTER DEVELOPMENT		TIME END 7:40 am		LOGGER Cira			
SAMPLE NO.	BLOWS ON SAMPLER	DRIVE	RECOVERY	VISUAL FIELD CLASSIFICATION		S.S. Dia 1.25"	Weight 140 #	Drop 30"	GRAPHIC LOG	WELL CONSTRUCT	REMARKS
2004A	3 4 3	18	12	1	Medium brown silty clay						Needed several drives to recover sample volume to split
X	6 6 7	18	18	2	Medium brown silty clay						3 3/4 IDHSA
X	3 4 7	18	18	3	Medium brown silty clay						
X	3 4 7	18	18	4	Medium brown silty clay						
2005	11 12 12	18	18	5	Medium brown silty clay w/or. mottles Abundant - Sandy						5'10"
X	8 11 12	18	18	6	Sand - medium some clay Light Grey - Dry						seal
X	8 12 16	18	18	8	Reddish brown medium sand						2 bags w/cave-in
				9	Grey medium to coarse sand, slightly moist						
2006	6 14 12	18	10	10	Reddish & brown sand moist some grey at top						HNU 3-5
X	1 2 3	18	15	11	Reddish brown fine sands - moist						WD40 on threads of auger at 10' & 15' length.
X	5 3 3	18	15	12	Reddish brown fine sands - moist						
X	5 3 3	18	15	13	Yellowish red fine sand - moist						
2007	3 2 2	18		14	Yellowish red fine sand - moist						
				15	Bottom - coarse light sand - wet						
X	5 5 8	18	18	16	Medium - coarse sand - saturated						Natural Cave-in
X	7 13 17	18	18	17	Medium - coarse sand - some fine gravels Medium brown - rounded gravels						
2008A	6 10 16	24	24	18	Medium - coarse sand - some fine gravels Medium brown - rounded gravels						4' blow-in
				19							
				20	E)B = 22.0'						22'



ENVIRODYNE ENGINEERS

WELL CONSTRUCTION DETAILS

Job No. 3059-30000

Boring No. MW-A

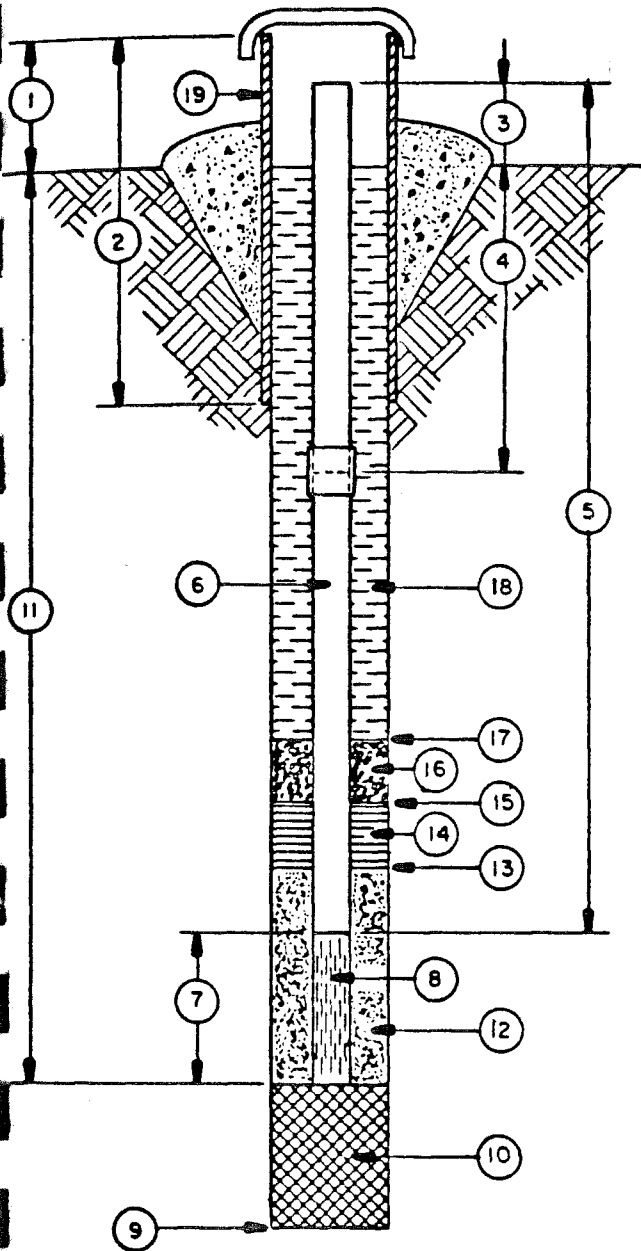
Date of Installation 4-21-87

Time Started 6:05

Time Completed 7:40

Ground Surface Elev. _____

All depth measurements of well detail are from ground surface unless otherwise indicated.



- ① Height of Protective Casing Above Ground 3.5'
- ② Total Length of Protective Casing 5.0'
- ③ Height of Standpipe Above Ground 3.5'
- ④ Depth to First Coupling 6.5'
Coupling Interval 10.0'/10.0'/0.3' CAP
- ⑤ Total Length of Blank Pipe 20.3
- ⑥ Type of Blank Pipe No. 316 S.S. 2" ID
- ⑦ Length of Screen 5.0' w/.3' PLUG
- ⑧ Type of Screen 0.01" SLOT-FACTORY
- ⑨ Total Depth of Boring 22' Hole Diam. 8"
- ⑩ Type of Material Medium to coarse natural cave sands
- ⑪ Depth to Bottom of Screen 22.1'
- ⑫ Type of Screen Filter Natural cave sands w/fine silica
Quantity Used 2 bags
- ⑬ Depth to Top of Filter 7'4"
- ⑭ Type of Seal Bentonite pellets
Quantity Used 1/2 pail
- ⑮ Depth to Top of Seal 5' 10"
- ⑯ Type of Seal Weight N/A
Quantity Used N/A
- ⑰ Depth to Top of Seal Weight N/A
- ⑱ Type of Grout Portland w/5% bentonite
Grout Mixture _____
- ⑲ Type of Protective Casing _____
Concrete Collar Mixture _____

Remarks:

4 ft. sand plug - attempting removal w/s. tubes. Pushed 2' out, advancing augers ahead of screen to push out, removed 5' of auger. 14'2" to top of cave-in.

FOR Van Tran Electric/IEPA

JOB NO. 3059-30000

LOCATION Vandalia, Illinois

ELEV.

BORING NO. MW-B

GROUND WATER				WHILE DRILLING <u>12.8'</u> BEFORE DEVELOPMENT AFTER DEVELOPMENT		DATE <u>4-23-87</u> TIME START <u>8:55 am</u> TIME END		DRILL CO. <u>PSI</u> DRILLER <u>Fernandez</u> LOGGER <u>Cira</u>	
SAMPLE NO.	BLOWS ON SAMPLER	DRIVE	RECOVERY	VISUAL FIELD CLASSIFICATION		S.S. Dia <u>1 1/2"</u> Weight <u>140#</u> Drop <u>30'</u>	GRAPHIC LOG	WELL CONSTRUCT	REMARKS
2014	6 6 8	18	18	1	Medium brown silty clay, tr. sand (v. fine) moist				ARDL Labs samples
X	6 8 10	18	10	2	Medium brown silty clay, tr. sand (v. fine) moist - some gravel				9:00 am Purina was at in fire, no smoke in ditch area.
X	7 8 9	18	12	3	gravelly, sandy clay - grey brown orange mottling				9:23 fire was out.
2015	10 9 9	18	18	5	Clayey fine sand red-orange to grey grading to medium sand last 0.2' some coarse gravel poorly sorted				
X	5 6 6	18	18	6	Some coarse gravel poorly sorted				
X	5 4 4	18	18	7	Light brown medium sand m. well sorted occ. small pebbles - moist				grout
				8	Yellow fine sand				8'4"
				9	Light brown-tan fine sand - well sorted				seal
2016	2 3 4	18	18	10	Light brown-tan fine sand - well sorted				9'11"
X	6 5 5	18	18	11	Reddish-orange fine sand - well sorted Moist				silica sand
				12	Some black ribboning at bottom 0.3'				
X	3 3 3	18	15	13	12.8 ∇ Caturated	12.8			
2017	2 2 1	18	12	14	Medium brown fine to medium m. well/sorted sand				
				15	Some fine gravel				
X	5 5 6	18	18	16	Medium brown fine to medium m. well/sorted sand				natural cave-in
				17	Some fine gravel				
				18	Medium brown fine to medium m. well/sorted sand				Bottom of well 17'10"
Shelby Tube					Some fine gravel				
					Medium brown fine to medium m. well/sorted sand				
					Some fine gravel				
					EOB 20.5'/20 1/2" in tube				



ENVIRODYNE ENGINEERS

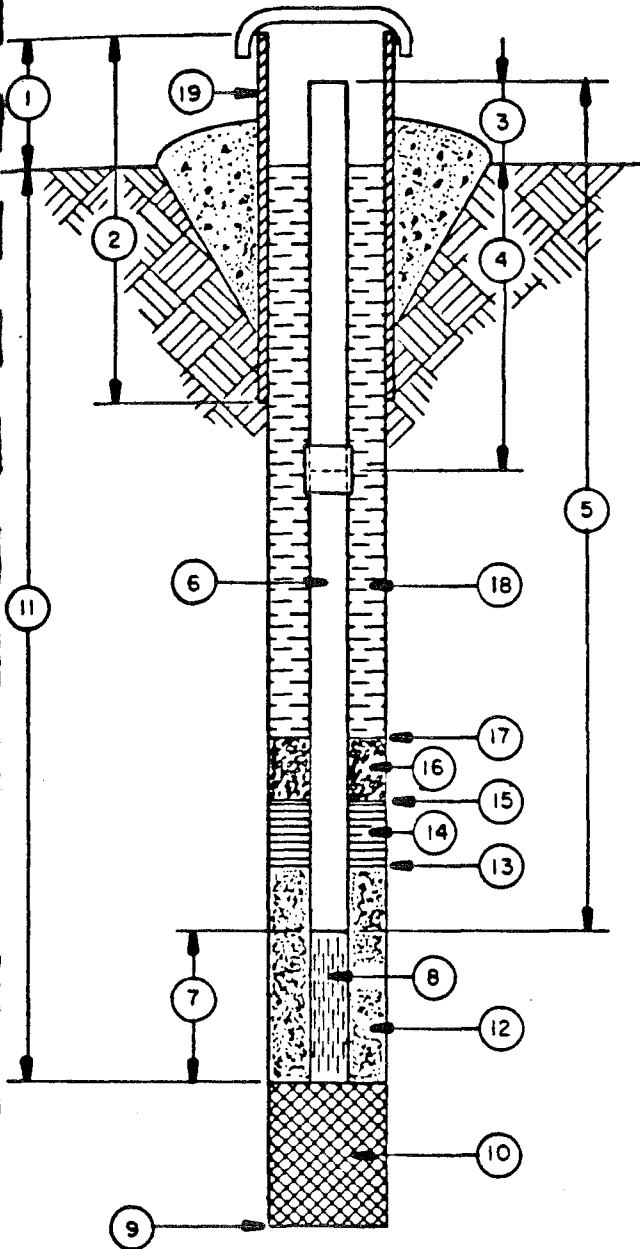
WELL CONSTRUCTION DETAILS

Date of Installation 4-23-87
Ground Surface Elev. _____

Job No. 3059-30000
Time Started 10:30

Boring No. MW-B
Time Completed 11:30

All depth measurements of well detail are from ground surface unless otherwise indicated.



- ① Height of Protective Casing Above Ground 27"
- ② Total Length of Protective Casing 5.0'
- ③ Height of Standpipe Above Ground 27"
- ④ Depth to First Coupling 2'
Coupling Interval 4 1/2', 5' screen, 10', 2', 2'
- ⑤ Total Length of Blank Pipe 14'
- ⑥ Type of Blank Pipe No. 316 S.S. 2" ID
- ⑦ Length of Screen 5'
- ⑧ Type of Screen No. 316 SS, 0.01" preslot
- ⑨ Total Depth of Boring 20.5 Hole Diam. 8"
- ⑩ Type of Material cave-in natural sands
- ⑪ Depth to Bottom of Screen 17'10"
- ⑫ Type of Screen Filter natural cave-in & silica
Quantity Used 1/2 bag
- ⑬ Depth to Top of Filter 9'11"
- ⑭ Type of Seal bentonite pellets
Quantity Used 1/2 bucket
- ⑮ Depth to Top of Seal 8'4"
- ⑯ Type of Seal Weight N/A
Quantity Used N/A
- ⑰ Depth to Top of Seal Weight N/A
- ⑱ Type of Grout 1 1/2 bag cement, 1/2 bag bentonite
- ⑲ Type of Protective Casing 4" 1D round steel
Concrete Collar Mixture hinge locking hasp

Remarks:

ENVIRONMENTAL
ENGINEERS

FIELD BORING LOG

Sheet 1 of 1

FOR - Van Tran Electric/IEPA

JOB NO. MW-C

LOCATION Vandalia, Illinois

ELEV. _____

BORING NO. 3059-30000

GROUND WATER		WHILE DRILLING 11.5		DATE 4-22-87		DRILL CO. PSI	
BEFORE DEVELOPMENT				TIME START 3:30 pm		DRILLER Fernandez	
AFTER DEVELOPMENT				TIME END 4:30 pm		LOGGER Ciria	
SAMPLE NO.	BLOWS ON SAMPLER	DRIVE	RECOVERY	VISUAL FIELD CLASSIFICATION		S.S. Dia 1 1/4"	GRAPHIC LOG
						Weight 140	
						Drop 30"	WELL CONSTRUCT
2009		18	1	Gravel fill in brown silty clay			
X	5 5 6	18 6	2				
			3				
X	5 5 6	18 12	4				
2010	3 5 8	18 12	5	Medium brown clay - moist			
			6	Medium brown clay - stiff, moist			
2010	12 14 15	18 10	7	Grey Fine clayey silt w/fine sand			
X	20 23 28	18 10	8	Grey silt w/clay Wet			
			9	Brown silty clay Moist			
2011	6 5 5	18 10	10	Occasional gravel Reddish orange fine - medium sand - moist			
X	3 4 6	18 15	11	Medium to coarse poorly sorted sands, fine gravel Wet			
2012	5 7 7	18 12	12	Medium to coarse, poorly sorted sands, fine gravel			
			13				
TUBE		24	14				
			15				
			16	EOB - 15 1/2'			
			17				
			18				
			19				
			20				



ENVIRODYNE ENGINEERS

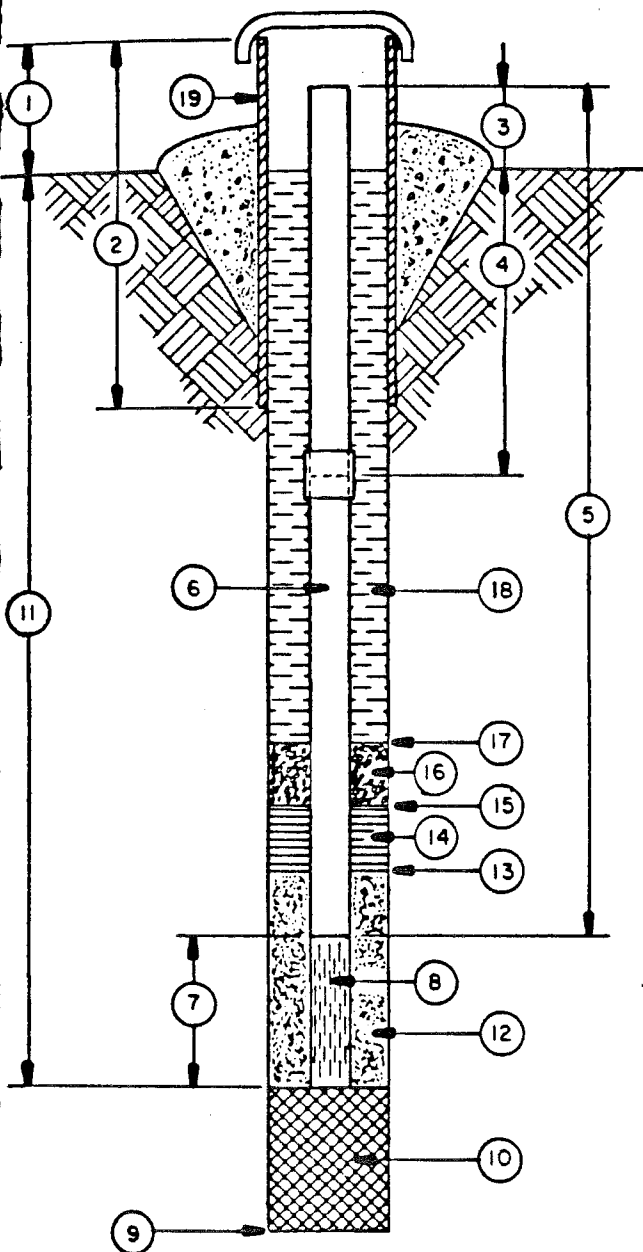
WELL CONSTRUCTION DETAILS

Date of Installation 4-22-87
Ground Surface Elev. _____

Job No. 3059-30000
Time Started 4:30

Boring No. MW-C
Time Completed 6:00

1 depth measurements of well detail are from ground surface unless otherwise indicated.



- ① Height of Protective Casing Above Ground 34"
- ② Total Length of Protective Casing 5'
- ③ Height of Standpipe Above Ground 32"
- ④ Depth to First Coupling 8"
Coupling Interval 2', 10' pipes
- ⑤ Total Length of Blank Pipe 13' 1 1/2"
- ⑥ Type of Blank Pipe No. 316SS 2" ID
- ⑦ Length of Screen 4' 11 1/2" w/4 1/2" plug
- ⑧ Type of Screen No. 316 SS. 0.01" Preslot
- ⑨ Total Depth of Boring 15 1/2 Hole Diam. 8"
- ⑩ Type of Material Natural sand cave-in
- ⑪ Depth to Bottom of Screen 14' 7" and 4 1/2" plug = 14' 11 1/2"
- ⑫ Type of Screen Filter Ottawa silica sand -fine
Quantity Used 1 bag
- ⑬ Depth to Top of Filter 7' 2"
- ⑭ Type of Seal bentonite pellets
Quantity Used 1/2 bucket
- ⑮ Depth to Top of Seal 5.0'
- ⑯ Type of Seal Weight N/A
Quantity Used N/A
- ⑰ Depth to Top of Seal Weight N/A
- ⑱ Type of Grout Portland/Powder bentonite
Grout Mixture 50% bentonite, 7:1 water
- ⑲ Type of Protective Casing locking, 4" diameter
Concrete Collar Mixture _____

Remarks:

Added sand (1/2 bag) through augers, well came up when augers were pulled, sand bridged decided to pull augers, while holding down w/hydraulic pressure.

GROUND WATER		WHILE DRILLING 9.0'		DATE 4-24-87		DRILL CO. PSI	
		BEFORE DEVELOPMENT		TIME START 2:20 pm		DRILLER Fernandez	
		AFTER DEVELOPMENT		TIME END		LOGGER Gira	

SAMPLE NO.	BLOWS ON SAMPLER	DRIVE	RECOVERY	VISUAL FIELD CLASSIFICATION	S.S. Die			GRAPHIC LOG	WELL CONSTRUCT	REMARKS
					Weight	Drop	ID			
2032	3 4 6	18	15	1			1 1/2"			
X	5 4 4	18	18	2			140#			
				3			30"			
X	3 4	18	12	4						
2033	5 5 7	18	18	5						
				6						
X	5 7 8	18	18	7						
2034	4 6 3	18	18	8						
				9						
X	2 2 3	18	18	10						
2035	6 3 4	18	18	11						
				12						
Tube	1 3 6	18	18	13						
				14						
				15						
				16						
				17						
				18						
				19						
				20						

FOR Van Tran Electric/IEPA
 LOCATION Vandalia, Illinois

JOB NO. 3059-30000
 BORING NO. MW-D

WHILE DRILLING <u>9'</u>				DATE <u>4-24-87</u>	DRILL CO. <u>PSI</u>			
BEFORE DEVELOPMENT				TIME START <u>2:20 am</u>	DRILLER <u>Fernandez</u>			
AFTER DEVELOPMENT				TIME END	LOGGER <u>Cira</u>			
SAMPLE NO.	BLOWS ON SAMPLER	DRIVE	RECOVERY	VISUAL FIELD CLASSIFICATION	S.S. Dia <u>1 1/2"</u> Weight <u>140#</u> Drop <u>30'</u>	GRAPHIC LOG	WELL CONSTRUCT	REMARKS
	11 21 32	18	18 21	Moderate well sorted, fine medium sand - saturated				Blow-in?
	augered to 25		22 23 24 25					
	1 1 1	18	18 26	Fine red brown sand - well sorted				
	augered to 30		27 28 29 30					
	9 14 11	18	18 31	Fine red brown sand - well sorted				
	augered to 35		32 33 34 35					
	17 99	12	3 36	Blue to light grey, very dense clay				Blow-in removing w/spoon
	augered to 40'		37 38					DTC left site at 4:23 - drillers trying to remove blow-in.
	30 89 49	18	39 40	40-41 1/2 Light grey, medium grained sand medium brown, medium grained sand				*grease added to hose fitting & residual anti-freeze flushed down boring.

LOCATION Vandalia, Illinois

ELEV. _____

JOB NO. 3059-30000

BORING NO. MW-1-D

GROUND WATER	WHILE DRILLING _____	DATE 4-26-87	DRILL CO. PSI
	BEFORE DEVELOPMENT _____	TIME START 9:30	DRILLER Ralph
	AFTER DEVELOPMENT _____	TIME END _____	LOGGER GMB

SAMPLE NO.	BLOWS ON SAMPLER	DRIVE	RECOVERY	VISUAL FIELD CLASSIFICATION	S.S. Dia 1.5" Weight 140# Drop 30"	GRAPHIC LOG	WELL CONSTRUCT	REMARKS
				45 Well sorted, gray medium sand (SW) grading into very fine grey well sorted quartz sand w/clay matrix - gray silty clay				
34 50 43	18" 9"							
				50 Dense, gray silty clay				
40 37 100	18 15							
				55 Dense grey silty clay, trace well rounded, poorly sorted quartz grains & black shale				
36 48 63	15 15							
				60 Dense grey, fine sandy silty clay, trace well rounded quartz grains				
17 35 54	18 12							



ENGINEERS

FIELD BORING LOG

Sheet 4 of 5

FOR - Van Tran/IEPA

JOB NO. _____

LOCATION Vandalia, Illinois

ELEV. _____

BORING NO. _____

GROUND WATER		WHILE DRILLING		DATE		DRILL CO.	
BEFORE DEVELOPMENT		AFTER DEVELOPMENT		TIME START		DRILLER	
				TIME END		LOGGER	
SAMPLE NO.	BLOWS ON SAMPLER	DRIVE	RECOVERY	VISUAL FIELD CLASSIFICATION	S.S. Dia Weight Drop	GRAPHIC LOG	REMARKS
			65	Grey clayey silt sand			
	13 45 85	18"	12'				
			70	Grey clayey silty sand			
	29 30 36	18	18				
			75	Grey, very fine well sorted sand			
	11 25 33	18	18				
			80	Grey fine to medium fine, well sorted sand			
	12 12 12	18	18				

ENVIRONMENTAL
ENGINEERS

FIELD BORING LOG

Sheet 5 of 5

FOR - Van Tran Electric/IEPA

LOCATION Vandalia, Illinois

ELEV. _____

JOB NO. _____

BORING NO. _____

GROUND WATER	WHILE DRILLING _____	DATE 4-27-87	DRILL CO. _____
	BEFORE DEVELOPMENT _____	TIME START _____	DRILLER _____
	AFTER DEVELOPMENT _____	TIME END 2:00 pm	LOGGER DTC

SAMPLE NO.	BLOWS ON SAMPLER	DRIVE	RECOVERY	VISUAL FIELD CLASSIFICATION	S.S. Dia _____ Weight _____ Drop _____	GRAPHIC LOG	WELL CONSTRUCT	REMARKS
				85				
	14 17 17	18	18	Light grey fine sand in clay matrix				
				90				
	100/ 6"	6	6	Grey silt w/fragments of limestone				
				95				
	100/ 3"	3	0	E.O.B. = 95.25'				
				4-27-87				
				10:16 am - Rods pulled				
				11:10 am - pulling augers, grouting boring				
				- pulled 10' grouted - repeat to surface				

grouted to surface

augered for verification - hard to auger, rig rocking on augers.



ENVIRODYNE ENGINEERS

WELL CONSTRUCTION DETAILS

Job No. 3059-30000

Boring No. MW-D

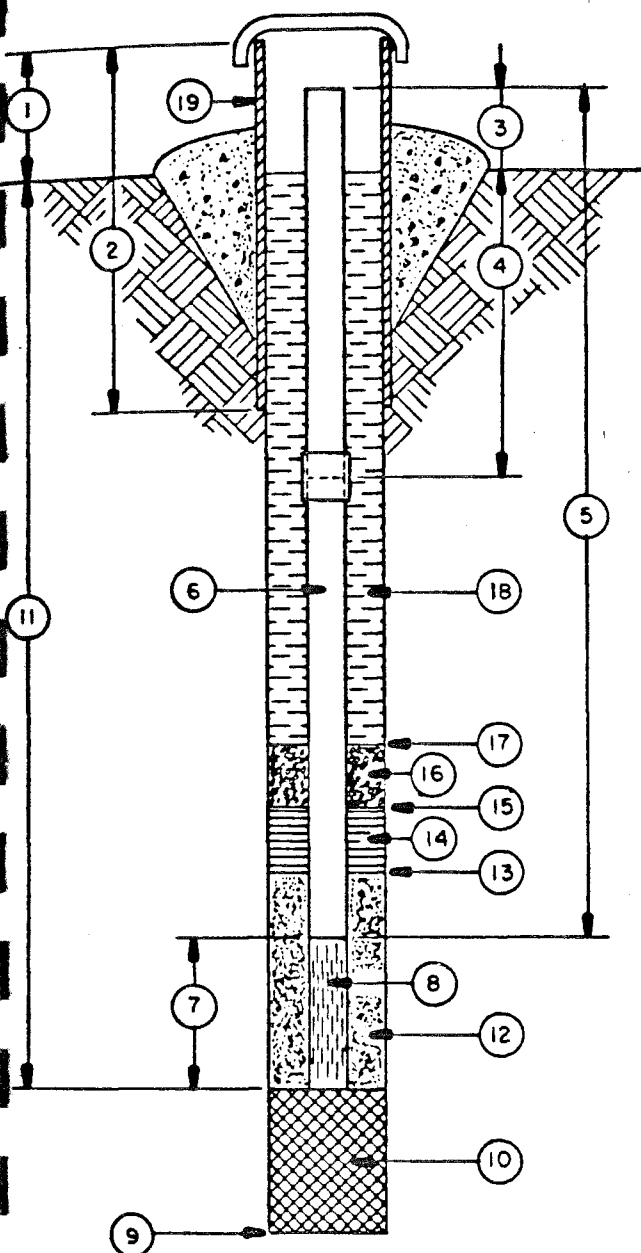
Time Started 2:30 pm

Time Completed 5:15

Date of Installation 4-26-87

Ground Surface Elev. _____

All depth measurements of well detail are from ground surface unless otherwise indicated.



- ① Height of Protective Casing Above Ground 2.8
- ② Total Length of Protective Casing 5.0'
- ③ Height of Standpipe Above Ground 2.7'
- ④ Depth to First Coupling 0.7
Coupling Interval 10'
- ⑤ Total Length of Blank Pipe 12'
- ⑥ Type of Blank Pipe No. 316 S.S. 2" ID
- ⑦ Length of Screen 5.0'
- ⑧ Type of Screen No. 316 S.S. 0.01" Slot
- ⑨ Total Depth of Boring 15.0 Hole Diam. 8"
- ⑩ Type of Material Natural sand cave-in
- ⑪ Depth to Bottom of Screen 14.5'
- ⑫ Type of Screen Filter Cave-in natural sand to 9.5'
Quantity Used Supplemented w/fine silica sand
- ⑬ Depth to Top of Filter 7.3'
- ⑭ Type of Seal Bentonite pellets
Quantity Used 1/2 bucket
- ⑮ Depth to Top of Seal 6.0'
- ⑯ Type of Seal Weight Not applicable
Quantity Used Not applicable
- ⑰ Depth to Top of Seal Weight Not applicable
- ⑱ Type of Grout 1/4 cement; 1/4 bentonite
Grout Mixture _____
- ⑲ Type of Protective Casing 4" round, steel, hinged
Concrete Collar Mixture grout

Remarks:

Boring from deep MWD hole up represents stratigraphy of this well
*had to move 15' west of deep boring to place well due to antifreeze
introduction into boring. Well boring taken to 15' w/out sampling -
well installed thru 3 3/4" IDHSA.